

NOTES ON SOME INDIAN AND BURMESE OPHIDIANS,—
by DR. F. STOLICZKA.

(With Plates XXV and XXVI).

[Received 22nd August, read 6th September, 1871.]

The following notes have for their object the recording of some observations which I lately had the opportunity of making on some Ophidians, partly from India, partly from Burma. These observations refer not only to certain variations in the characters of the species themselves, or to their identification with others, but are also intended to afford some additional information regarding the geographical distribution of the various forms.

Most of the snakes which I am about to notice belong to the TYPHLOPIDÆ, COLUBRIDÆ and DIPSADIDÆ. Under the first family, I shall note variations of different species of *Typhlops*, and shall describe three new ones. In the COLUBRIDÆ the identification of Blyth's *Tropidonotus macrops* with Günther's *Tropidonotus macrophthalmus* is important. From Burma I have to record a new species of *Tropidonotus*, apparently distinct from *quincunctiatus*. A description of *Trimeresurus Andersoni* is also added, because the distinctness of that species has lately been questioned.

For the materials, noticed in the present paper, I am greatly indebted to Dr. Day who obtained specimens for me from the North-West Provinces, to Mr. Wood-Mason, Mr. A. Lawder at Almorah, to Mr. Mandeli who kindly collected for me in the Rangnu and Tista valleys in Sikkim, to Mr. M. R. Martin at Pankabaree, and to Mr. Kurz, who brought me some interesting species from Burma. Some species were also collected by myself in the neighbourhood of Calcutta, others at the Parisnâth hill in W. Bengal, others in the neighbourhood of Darjeeling.

Trustworthy notices regarding the geographical distribution of Indian and Burmese snakes are very much needed, and this is particularly the case with those species inhabiting the southern slopes of the Himalayas. A number of unreliable data as to the occurrence of certain low-land and tropical forms at elevations of from 9000 to 12000 feet, or even in Tibet and Ladak, have crept into Indian Zoology, chiefly through the occasional vague records of the

Messrs. Schlagintweit, and other collectors, and these apparently authenticated statements have given rise among European Zoologists to all kinds of strange ideas, either about the adaptitude of the Himalayas to different faunas, or about the plasticity of the organization of certain species enabling them to inhabit very different elevations and climates. There is, in reality, no foundation for such ideas, and the sooner these wrong notions and interpretations are dissipated, the better will our fauna be understood, as well as the physical character of the Himalayas themselves. Tropical and subtropical forms often occur in the Himalayas far in the interior, and in very close proximity, but they are always confined to the deep, warm and damp, valleys, while at the greater elevations of the neighbouring ranges an altogether different fauna exists. Thus, although frequent reference is made to one place as the locality of a species, this may really refer to an entirely different division of the fauna, and this is what constitutes the great peculiarity of the Himalayas regarding the distribution of animal and vegetable life, and the difficulty of understanding it, as I have pointed out (in Journ. Asiat. Soc. Bengal, 1868, vol. xxxvii, p. 4 et seq.) with reference to the Sutlej valley.

As a particular instance in illustration of these remarks, I give the following list of species of snakes which were obtained by Mr. Mandeli, or by myself, in the Rangnu and Tista valleys below and S. E. of Darjiling, mostly at elevations varying from 1500 to 3000 feet. They are—

Typhlops Horsfieldi, (rare); *T. braminus*, (common); *T. porrectus*, (n. sp., rare); *Trachiscium fuscum*, (common); *Ablabes collaris* and *Rappii*, (common); *Simotes punctulatus*, var. α , β and γ , apud Günther, (common); *S. bicatenatus* (not common); *Zaocys nigromarginatus*, (rare); *Compsosoma reticulare*, (not common); *Comps. radiatum*, (common); *Comps. Hodgsoni*, (rare); *Coluber porphyraceus*, (common); *Tropidonotus subminiatus*, (common); *T. quincunctiatus*, (common); *T. macrops*, (not common); *T. junceus*, (rare); *T. Himalayanus*, (rare); *T. platyceps*, (common); *Dendrophis picta*, (common); *Chrysopelea ornata*, (not common); *Tragops prasinus*, (common); *Passerita mycterizans*, (not common); *Psammodynastes pulverulentus*, (rare); *Pareas monticola*,* (rare); *Dipsas bubalina*,

* Günther I. R., p. 327. In a specimen no labials enter the orbit, a small

(very rare); *D. Forsteni*, (very rare); *D. hexagonotus*, (common); *Lycodon aulicus*, (not common); *Lyc. jara*, (rare); *Bungarus cæruleus* var. *a*, (not common), *Naja tripudians*, (not common) and *Ophiophagus elaps*, (not common), the former growing in the Terai up to 6 feet, and the latter attaining occasionally 12 feet in length; *Trimeresurus gramineus*, *carinatus* and *monticola* (none, except the last, common).

Now of all these species, for most of which the locality 'Darjiling' (8000 or 9000 feet) has already been recorded, not a dozen will be met with at that place itself, or even at elevations above 6000 feet. Within 1000 or 2000 feet of Darjiling I only observed *Trach. fuscum*, *Abl. collaris*, *Comps. Hodgsoni*, *Trop. subminiatus*, *junceus*, *platyceps* and, I think, *Himalayanus*, *Trim. monticola*, *Bungarus* and *Naja*, the two latter evidently following up food. The lower we descend on the hill side from 6000 feet, the greater becomes the variety of genera and species.

The species of snakes which I received through Mr. Kurz from the Pegu Yomah (between Prome and Tonghoo) are *Typhlops braminus*, *Simotes bicaenatus*, *Trop. quincunctiatus*, *macrops*, *junceus*, *bellulus* (n. sp.), *Psammodynastes pulverulentus*, *Tragops prasinus*, *Dendroph. picta*, *Hypsirhina enhydris*, *Lyc. aulicus* and *jara*.

Fam. TYPHLOPIDÆ.

While examining a large number of Indian species of *Typhlops*, I found the proportion of the circumference to the length of the body a useful character, and the number of longitudinal rows of scales generally very constant. These two characters were also regarded by Dr. Günther as important in distinguishing species, but Prof. W. Peters appears to have come to an almost entirely contrary result, particularly regarding the latter.

TYPHLOPS HORSFIELDII, (I. R.,* p. 173).

This species, as characterized by Gray and Günther from typical sub-ocular being present. There are two black streaks at the side of the body, one originating just above the orbit, and the other at about the middle of the posterior edge of the same, they become confluent at the side of the neck, joining two short streaks from the posterior edge of the occipitals, not forming, however, a ring.

* The quotation (I. R.) in parenthesis refers to Dr. Günther's Reptiles of British India, published in 1864, by the Ray Society.

Khasi hill specimens, extends from Mergui northwards through Burma and Assam into Sikkim. I have seen specimens from all these parts. The median row of scales along the back is in a specimen from Pankabaree of a slightly darker colour than the rest of the body; this specimen has 26 long. rows of scales on the anterior part of the body, and 27 just behind the middle.

Dr. Günther (l. c., p. 173) suggests that Dum. and Bibron's *T. Diardii* may be the same as the present species, and Prof. Peters (Monatsb. Berlin Akad., 1865, p. 262) appears to have no doubt about their identity. Dumeril and Bibron give in *Diardii* 36 long. rows of scales which is probably a misprint for 26. But what makes me doubtful about accepting the older name *Diardii*, is Prof. Peters' identification with it of his *striolatus* and Günther's *bothriorhynchus*. I have not seen a specimen of the former, but would consider it a distinct species according to Günther's description; the latter I shall notice presently. Moreover, in a more recent volume of the "Monatsberichte" (1868, p. 450), Prof. Peters says that an adult specimen of *Diardii* has 28, and a young one only 18 long. rows of scales. I do not mean to assert that species of *Typhlops* should be distinguished solely according to the number of rows of scales, but I can say that I never observed anything approaching such a variation in any Indian species of *Typhlops*. Indeed, if the proportions of the body should be the same in those two forms, the scales certainly cannot be of the same type, and *vice versa*.

2. TYPHLOPS BOTHRIORHYNCHUS, (I. R., p. 174).

The type was from Penang, wherefrom I also received several specimens, though very probably they were collected in the Wellesley Province, opposite Penang. Dr. Anderson (J. A. S. B., vol. xl, pt. ii, p. 33) quotes the species from different parts of Assam, and I have lately obtained through Dr. Day a specimen from near Hurdwâr. All these specimens agree almost exactly in every point of structure, proportional size and coloration, with Günther's description. The Hurdwâr specimen, for instance, has 24 long. rows of scales, 312 trans. rows on the body, and 9 on the tail, the latter terminating with a sharp point. The head shields are exactly

as figured by Günther in *bothriorhynchus*, and not as in *Horsfieldii*; the circumference ($\frac{1}{3}$ distant from the head) is $\frac{1}{12}$ the length of the body; total length 11 inches, tail about $\frac{1}{4}$ inch; above brownish olive, paler below; the upper coloration appears at first sight uniform, but when the specimens had been a little dried, the base of each scale appears darker, and is separated from the slightly less dark terminal half by a pale line.

Professor Peters, as already observed, identifies this species with *Horsfieldii* (and *Diardi*), but when we find specimens with constant characters distributed over such a large geographical area, as the one I have noticed, there is, I think, reason to believe, that they constitute a good species, and, therefore, I would consider *bothriorhynchus* as such, until its identity with the previous species has been more satisfactorily proved.

TYPHLOPS BRAMINUS (I R., p. 175).

This is the most common Indian species, occurring in Ceylon, and extending, through South and Central India, northwards into the warm valleys of the lower Himalayas, westwards all through Bengal and Burma into the Malayan Archipelego. In some 50 specimens (several of which were only 3 inches long) from Burma, Bengal, North-West and Central Provinces, I almost invariably found the 20 long. rows of scales, when counted in a distance of one-third the length of the body from the head. In very few instances only was there one scale less on the neck, or one more in the middle of the body, but the variation was never greater. This makes me believe that the number of longitudinal rows of scales is among others a very good character. As a rule the number of scales appears to be independent of the diameter of the body, as I shall again notice when speaking of *T. porrectus*, n. sp. The usual length of full grown specimens is 6 inches, some examples reaching 7, but very rarely 8 inches; the thickness is nearly uniform throughout, except at the neck, which is slightly thinner, and the head is more or less flattened. I found the proportion of the circumference of the body to its length vary between $\frac{1}{12}$ and $\frac{1}{17}$, the former being the most common, $\frac{1}{14}$ not unusual, $\frac{1}{16}$ th very rare, and $\frac{1}{17}$ th was only observed in one half grown specimen.

The upper side is lighter, or darker, greyish, or olivaceous, brown, the basal half, or two-fifths of each scale being darker than the rest; the lower side is either greyish, or almost purely, white; round the mouth, the tip of tail and in front of the anus generally purely white, except in very young specimens, which are of a more uniform coloration throughout.

In addition to the synonyms of this species, quoted by Günther, Peters gives* *Argyrophis truncatus*, Gray, (from the Philippines) and *Onychocephalus capensis* Smith (from ?), and considers it probable that *Typhlops accedens*, Jan, and *T. pammece*s of Günther also belong to it. As to the three first suggestions I cannot speak from experience, but the last named species of which I have examined a few specimens† I am inclined to consider with Dr. Günther provisionally as distinct from *braminus*.

The specimens which appear to me referable to *T. pammece*s are all of a nearly uniform pale brown color, while in true *braminus* the lower side is always conspicuously paler than the upper; the proportions of circumference in *pammece*s I found to vary between $\frac{1}{2}0$ and $\frac{1}{2}6$, indicating a decidedly thinner snake than *braminus*; the structure of the headshields and the number of longitudinal rows (20) of scales is in both the same, as stated by Günther.

TYPHLOPS PORRECTUS, n. sp. Pl. xxv, figs. 1—4.

Body very long, slender, of nearly equal thickness throughout, neck somewhat contracted, but the head is again slightly broader and depressed. Rostral broader above than in front, its width above being about one-third of that of the head, the posterior margin is slightly narrowly rounded. The nostrils are placed rather in front than laterally. The nasal is divided from the fronto-nasal at the lower side, but in front towards the rostral both are united. The fronto-nasals extend posteriorly slightly beyond the rostral, but do not meet each other. The nasal is in contact with the first and second upper labial, the former being very small; the fronto-nasal touches only the 2nd labial. The præ-ocular and ocular are about

* Monatsb. Berlin Akad., 1865, p. 262.

† These are all in the Indian Museum, except one which I obtained about two years ago near Calcutta.

equal in size, but each is shorter than a fronto-nasal; the præ-ocular is in contact with the 2nd and 3rd, and the ocular in contact with the 3rd and 4th labials. The præ-frontal, frontal and supra-oculars are subequal in size, the parietals a trifle larger, and the inter-parietal a little smaller, followed by a slightly larger scale. The eye is very indistinct, situated below the anterior part of the suture between the supra-ocular and the ocular. The first upper labial is very small, and in young specimens hardly traceable, the second is distinct, the fourth considerably higher, but longer than the third, and both reach well upwards at the side of the head. All the shields of the head are finely punctate.

Of eight specimens measured, of various sizes and ages, the circumference was between $\frac{1}{24}$ th and $\frac{1}{27}$ th of the length of the body, the majority of the specimens being $\frac{1}{28}$ th; the tail equals about the head in length, it is slightly curved and terminates with a short, blunt point. There are 18 longitudinal rows of smooth shining scales round the body, in young as well as in full-grown specimens; the diameter is 2.5 or 3 mm.; 406 (in young) to 416, 428, 440 (in adults) transverse rows of scales round the body and 11-12 rows round the tail.

The general colour is very like that of *T. pammeces*: above pale chocolate or leaden brown, below paler, the two colours passing insensibly at the sides into each other; head, above, and partially also the neck, whitish, in front and below purely white; in front of the anus and the entire tail below white. In some dark coloured specimens there occasionally occur traces of small white blotches at the side of the body; the median row of scales along the belly is also sometimes a little paler than the rest of the underside. All scales have their bases darker coloured than the remainder, but on the upper neck the reverse appears to be the case, the base of each scale appearing in reflected light whitish, while the terminal half is darker brown. The sutures between the head shields above are dotted with white.

The usual length is between 6 and 7 inches. The longest specimen measured is 11 inch., the circumference being only $\frac{1}{22}$ nd of the length of the body. In this adult specimen which is from Hurdwâr, the head becomes remarkably small and is almost thinner than the neck; but it has 18 longitudinal, and 440

transverse rows of scales, and the head shields are as described above; the smaller basal portion of the scales, however, is almost throughout apparently the lighter one, it being blackish grey in reflected light, while the larger terminal part is brownish.

I have obtained this species alive in the neighbourhood of Calcutta, and collected it also at the foot of the Parisnáth hill, (in Western Bengal); one specimen was sent to me by Mr. Mandeli from the base of the Rangnu valley below Darjiling, and a young specimen was obtained south of Agra. Most likely the species has as wide a distribution, as *T. braminus*. In general form it very closely resembles Günther's *T. pammeces*, but differs from it in the structure of the head shields and the number of scales round the body; the latter are 18 in number, as in *T. mirus* from Ceylon, but the head shields are different, the nasal being in the latter separate from the fronto-nasal, and there being a sub-ocular present; the body is also thicker in proportion.

Pl. xxv, Fig. 1. Outline of the body in natural size, figs. 2, 3, 4, side, upper and lower views of head and neck, enlarged.

TYPHLOPS ANDAMANENSIS, n. sp. Pl. xxv, figs. 9-12.

Body moderately slender, head depressed, roundly obtuse in front, neck conspicuously slender; circumference of body a little less than $\frac{1}{17}$ th of its length. Rostral reaching far on to top of head, rounded behind, slightly broader than one-third of its width. Frontals, supra-oculars, inter-parietals and parietal, regular, subequal in size; nasal small, separated from the fronto-nasals by a suture in front and below; fronto-nasals not meeting behind the rostral; two præ-oculars, one below the other, the lower much smaller than the upper; ocular moderate with the eye indistinctly visible through the shield; an elongated subocular present; four labials: first smallest, elongate, in contact with the nasal, 2nd much larger, narrowly touching the nasal, broadly the fronto-nasal, and again somewhat narrowly the lower præ-ocular, 3rd in contact with the lower præ-ocular and the sub-ocular, 4th slightly smaller than the third, and only narrowly touching the sub-ocular and more broadly the lower post-ocular. Lower rostral small, followed on either side by 5 subequal lower labials. There are

18 longitudinal rows of scales, about 390 transverse rows round the body and 17 round the tail; this is nearly three times the length of the head, very obtuse and terminating with a minute point.

General colour above shining deep brownish black, the base of scales being somewhat dull black, sides vinaceous, paler on the lower side, which is throughout checkered with white; mouth and the tail below, including the tip, also mostly white.

This species resembles in general form and number of scales the Ceylonese *T. mirus*, but differs from it by having a lower præ-ocular besides a distinct sub-ocular, and in the arrangement of the labials; the colour is also somewhat different.

Hab. Andaman islands. A single specimen has been examined; it measures about $6\frac{1}{2}$ inches of which the tail is $\frac{1}{4}$ inch.

TYPHLOPS THEOBALDANUS, n. sp. Pl. xxv, figs. 5—8.

T.—? Theobald, Cat. Rept. Mus. Asiat. Soc. Bengal, 1868, p. 42.

Body very long and comparatively slender, of nearly uniform thickness throughout.

The general structure and arrangement of the head-shields and of the labials agrees with those in *T. porrectus*, but the rostral reaches very far back on the top of the head, and is considerably more than one-third (nearly $\frac{1}{2}$) of its width, much contracted, however, below; the first frontal is very slightly larger than the second, and the inter-parietal is very short, but about equal in width to the preceding frontal. The head itself is rather obtuse and somewhat depressed; the head shields most minutely punctate; eyes perfectly indistinct. There are 22 longitudinal rows of scales round the body; 485 transverse rows on the trunk, and 26 on the tail, which is of considerable length, terminating in an obtuse point, not developed into a distinct spine. The circumference is $\frac{3}{26}$ th the length of the body.

Total length 14 inches of which the tail is $\frac{7}{12}$ th inch. The general colour is rather pale greyish brown, slightly paler below, no particular dark markings are seen on the scales.

The species is readily distinguished from *T. tenuicollis*, Peters, (Monatsb. Berlin Akad., 1864, p. 272), said to be from the Himalayas, and also possessing 22 longitudinal rows of scales, by the great length of its tail.

The single specimen is in all probability from India, but without any specified locality; it is in the old collection of the Asiat. Soc., now held in trust by the Indian Museum.

Figs. 5, 6, 7, side, top and lower views of the head and neck, enlarged; fig. 8, under view of the tail, natural size.

Fam. OLIGODONTIDÆ.

SIMOTES BICATENATUS, (I. R., p. 217).

Not an uncommon species in Pegu, Cachar, Assam and in Lower Bengal extending northwards to the base of the Sikkim Himalaya. The coloration is very variable, as noticed by Theobald in his Catalogue of Burmese Reptiles (Linn. Soc. Journ. Zool. vol. x. The brown longitudinal bands generally disappear in old age, particularly in Burmese examples. Most of the specimens, I saw, have 2 + 2 (instead of 1 + 2) temporals,* and the lower præ-ocular is sometimes almost obsolete.

Family COLUBRIDÆ.

ABLABES COLLARIS, (I. R., p. 228).

The loreal is sometimes minute, barely $\frac{1}{3}$ rd the size of the præ-ocular. Full grown male specimens have the edges of the ventrals often purplish, similarly coloured to *Trop. platyceps*.

Hab. Assam, and Northern Bengal, North West Provinces, and extending from Sikkim along the Himalayas westward to the Sutlej valley, and up to elevations of about 10000 feet.

COMPSOSOMA RADIATUM, (I. R., p. 243).

This characteristically Malayan species is tolerably common at the base of the Sikkim hills and in the low valleys. I have obtained specimens $6\frac{1}{2}$ feet in length from the Sikkim Terai. Several had the two last maxillary teeth very little larger, and closer together, than the rest, but the median teeth were usually not, or scarcely, enlarged.

COMPSOSOMA HODGSONI, (I. R., p. 246).

I have received this species from Kumaon, through my friend Mr. Lawder. Last year (Journ. A. S. B., xxxix, pt. ii, p. 189), I recorded the occurrence of the species from the neighbourhood of

* Compare Anderson in Proc. Zool. Soc., 1871, p. 170.

Simla, which gives it a geographical distribution extending over the Southern Himalayan slopes between Sikkim on the east and the Sutlej on the west.

Together with the above species I also received from Kumaon *Dendrophis picta*, which is found up to 6000 feet on the southern slopes of the Hymalayas in Sikkim, Kumaon and the Sutlej valley.

ZAMENIS FASCIOLATUS, (I. R., p. 254).

Rather a fierce snake when molested. It is rare in houses about Calcutta, and feeds on frogs and worms. Full grown individuals (about 3 feet in length) are almost uniform; with the cross bands indistinct. Young specimens have a brighter coloration. One measuring $13\frac{1}{2}$ inches (of which tail is 3") had 21 scales on neck, 22 round the middle of the body; ventrals 200; sub-caudals 32; two præ-oculars, the lower very small; two post-oculars; 2+3 temporals. Günther's figure is on these points at variance with his description.

General colour during life olive green above, posterior part of head variegated with dark brown, with some whitish spots on the occipitals. Body with numerous transverse white streaks, each about one scale wide, edged posteriorly with dark brown. At the sides the streaks often branch off and form indistinct reticulations. Before reaching half the length of the body all the white streaks become dull, and are gradually replaced by narrow pale green or brownish dots. Tail uniform olive above. The two last rows of scales at each side are greenish white, in the penultimate row most of the scales have a pale brown spot, and in the last all have it; upper præ-ocular, the two post-oculars mostly, chin wholly, white; rest of lower side uniform greenish white.

TROPIDONOTUS QUINCUNCTIATUS (I. R., p. 260), var. Pl. xxvi, fig. 1.

This is one of the most variable and at the same time most widely distributed of Indian snakes. It is a true water snake with well developed valvules in the nostrils, which are somewhat laterally situated, and more upwardly turned than in other *Tropidonoti*; it is often found inhabiting holes in the banks of rivers and tanks. Were it not for the very great similarity in general

structure with other more terrestrial species of *Tropidonoti*, it could form a separate genus.

In addition to the numerous varieties recorded by Günther, (l. cit.), Theobald (Linn. Soc. Journ. Zool., vol. x), Blanford and myself (J. A. S. B., vol. xxxix, pp. 190 and 371), I have to notice a peculiar form found by Dr. Day at Rurki in the N. W. Provinces.

This specimen (see pl. xxvi, figs. 1 and 1a) has the usual narrowly triangular shape of the anterior frontals, but the posterior frontals are united into one large shield; 19 rows of scales, the median keeled, the laterals almost smooth; 143 ventrals; 94 sub-caudals. The colour is olive above, on the anterior half of the body the skin between the scales is reticulated with black: 6 alternating, somewhat irregular, longitudinal series of small dull whitish spots, becoming less distinct towards the tail; below, uniform whitish with some traces of black at the outer lateral edges of the ventrals; the two oblique black streaks below the eye are scarcely indicated.

This mode of coloration is very commonly met with in young specimens of this species, particularly in those occurring along the base of the Himalayas and in the Assam and Khasi hills, but in old specimens the olive becomes darker, gradually turning to brown or almost black, the whitish spots become bright yellow, and are often dissolved into reticulations, and the skin between the scales, especially at the sides, is bright vermilion, the latter colour appearing to be rather seasonal than sexual.

TROPIDONOTUS BELLULUS, n. sp. Pl. xxvi fig. 2.

Habit slender, body a little compressed; head not very distinct from neck; eye rather large; anterior frontals moderately truncate in front, smaller, but slightly longer than the posterior; occipital 5-sided, sides concave, longer than the front edge, posterior margins shortest forming a right angle, its length somewhat more than the two frontals together, and about equal to the superciliaries which are somewhat broader posteriorly than anteriorly; occipitals very large, obtusely angular behind; two large nasals; one square loreal; one narrow præ-ocular, reaching to the top of head, but not meeting the vertical; three post-oculars; 9 upper labials, 4th, 5th and 6th entering the orbit; temporals 1 + 2, there being

two large shields behind each other along each side of the occipitals; 19 rows of sharply keeled, rather narrow scales; 140 ventrals, 63 sub-caudals.

There are 20 or 22 maxillary teeth, the last barely longer than the preceding, and all appear to form a continuous series; but the specimen is young and the maxilla not very well preserved. It is, (in *Tropidonoti* at least), very often the case, that young specimens have a considerably larger number of maxillary teeth than old ones.

Colour, above, olive brown, with two longitudinal series of black dots along the back, sides of neck with transverse yellowish bars, the skin next to the bars being intensely black, the bars themselves becoming gradually indistinct, and passing towards the middle of the body into indistinct spots and reticulations; each occipital near the suture with a yellow spot, edged with black, and there is also a similar yellow spot on the shield wedged in between the angular terminations of the occipitals. All three spots very probably disappear with age, as they also do in other allied species. Præ- and post-oculars mostly bright yellow, upper labials greenish yellow, each with its hinder edge black, the same is the case with the lower labials, and all the ventrals and sub-caudals have their edges deep black; chin white; general color below greenish or dull white.

This description is taken from a rather young specimen, measuring only $16\frac{1}{2}$ inches, of which the tail is 5 inch, but it appears to be distinct from any of the known Indo-Malayan species. The general coloration and several points in the structure of the shields of the head closely resemble *T. trianguligerus*, (Reinw.), but, taking Schlegel's figure of this species as a guide, the present form differs by the much more elongated shape of the vertical, larger occipitals, only one anterior temporal, generally smaller and narrower scales, and by the yellow and black bars at the side of the body being differently shaped. The form of the vertical of *bellulus* agrees with that of *T. quincunctiatus* but the frontals are comparatively larger and less pointed in front, and there are 3 labials below the orbit although there are three well developed post-oculars present. In other respects, particularly in the black edged ventrals, the species very closely agrees with the variety described by Daudin, Schlegel and Cantor as *T. umbratus*.

The only specimen was collected by Mr. S. Kurz in the hills between Prome and Tonghoo, in N. Western Pegu.

TROPIDONOTUS HIMALAYANUS, (I. R., p. 268).

The shields of the head are somewhat variable in this species. The normal number of upper labials is 8; but sometimes there are 9 present on one or on both sides, the 2nd and 3rd labials being replaced by 3 smaller ones. The temporals are 1 + 2 or 2 + 2 or 2 + 3, the two latter variations are common in young specimens. In the live snake, the collar is bright orange yellow, the reticulations between the scales on the anterior half of the body are yellow, posteriorly passing into dull white. The lateral pale spots on the upper side are sometimes replaced by transverse narrow white streaks.

The species is not common in Sikkim, and mostly confined to the lower valleys, rarely going up to or above 5000 feet.

TROPIDONOTUS JUNCEUS, (I. R., p. 268).

This species occurs in Sikkim mostly in the warmer valleys, at about 3000 feet elevation; rarely near Darjiling at nearly 6000 feet; Mr. Blanford found it in the Tista valley at Thamlung, at about 5000 feet. Mr. Kurz collected some specimens in the Pegu Yomah, between Prome and Tonghoo.

The species rarely attains a larger size than 30 inches. The general coloration is as described by Günther, but the lower side is during life distinctly yellowish; the lateral black dots on the ventrals are sometimes partially, sometimes altogether, absent, and male specimens often have a red band running at each side of the body along the edges of the ventrals, similar to that seen in *Trop. platyceps*.

TROPIDONOTUS SUBMINIATUS (I. R., p. 265). Pl. xxvi, fig. 3.

A common species in Pegu, Assam and Sikkim and, although chiefly inhabiting hilly country, it is rarely found above 3000 or 4000 feet, but mostly at lower elevations in the warm valleys. Sikkim specimens perfectly agree in their bright coloration with those from Pegu, described by Theobald in vol. x of Linn. Soc. Jour.,



Trienops Persicus.



Zoology. The head is greenish olive, the collar brownish green or black, margined posteriorly with more or less bright orange yellow, most conspicuous at the sides; on neck not only the interstitial skin but also the scales are in males strongly tinged with bright vermilion. Body brownish or greyish olive, anteriorly; or entirely, reticulated with black and yellow; tail uniform olive green.

The usual size is 2 or $2\frac{1}{4}$ feet, it rarely grows above 3 feet, and specimens of this size lose very much of their former bright coloration. A very large specimen was sent to me from the Rangnu valley below Darjiling; it measured 44 inches, of which the tail is 11 inches. This specimen is above uniform brownish green, neck behind the head yellowish green, followed by a large vermilion patch. There are at the sides only traces of yellow reticulation, this colour turning to white in spirits; anterior ocular whitish, lower portions of upper labials pale; below uniform dull white, sides of all ventrals and sub-caudals tinged green, like the upper body, but without any black dots. The black spot below the eye, so conspicuous in younger specimens, is entirely absent. This same specimen (comp. pl. xxvi, fig. 3,) differs somewhat in structure also from others. There are 19 rows of keeled scales, the outermost at the sides much enlarged and smooth; vent. 159; sub-caudals 81; vertical pentagonal, with a broad front edge, its length about equal to one of the sides which are slightly concave and converging posteriorly; each supra-orbital smaller than the vertical, and barely longer; each occipital larger than vertical, posteriorly angular; 3 post-oculars (rarely 4, on one or on both sides), 9 upper labials,* 4th, 5th and 6th entering the orbit, the 7th, and 8th largest; temporals 2 + 3, the two anterior are in contact with the two lower post-oculars, and the lower is much larger than the upper. The three posterior temporals are arranged in an oblique line extending from the occipital to the 9th labial. Lower labials 10, the two first appear to be a divided shield, and 9 seems to be the normal number. The last three lower labials rapidly decrease in size, and below them is a single large shield, occupying a similar position to that in Schlegel's figure of *trianguligerus*.

* This is the usual number in Sikkim and Burmese specimens, 8 labials are rather rare.

The dentition varies with age. Young specimens generally have 22 maxillary teeth, the last two large and widely separated from the rest. In full grown individuals, the number is reduced to 14,* of which the two last are very large, and enclosed in a separate pouch.

TROPIDONOTUS MACROPS, Blyth.

Journ. Asiat. Soc. Bengal, 1855, vol. xxiii, p. 296, and Günther, I. R., p. 263.

Syn. *Trop. macrophthalmus*, Günther, 1858, (I. R., p. 262, pl. xxii, fig. C).

? *Trop. Silkkimensis*, Anderson, Journ. A. S. B., 1871, vol. xl, p. 17.

Although the description of the coloration of Blyth's *macrops* perfectly coincides with that of *macrophthalmus*, as described and figured by Dr. Günther, there are in Blyth's original description of *macrops* two curious mistakes which naturally prevented Günther from identifying his snake with that of Blyth, and which could not have been detected without the examination of the original specimens of *T. macrops*.

Blyth says (loc. cit. p. 297)—“Seventeen ranges of scales : scutæ 164—6 ; scutellæ 130—46 pairs;” and again further on “scutellæ 124 pairs only.” I have examined the type specimens, and I find in the specimen quoted by Blyth as being 31 inches long, of which the tail is $6\frac{1}{4}$ inches, that there are 19 rows of scales on the anterior part of the body, but only 17 rows behind the middle ; there are 168 ventrals, or, if we exclude two single shields following the chin-shields and properly situated under the head, there are 166, as quoted by Blyth ; and there are $74\frac{1}{2}$ pairs of sub-caudals, or if we exclude one smaller shield immediately following the anus and the single one occupying the tip of the tail, there are 73 pairs, which number doubled gives “scutellæ 146,” as stated by Blyth, the addition “pairs” in this instance being also a *lapsus calami*. What size would the shields of 146 pairs of sub-caudals be in a tail of which the length is only $6\frac{1}{4}$ inches ? An exactly similar mistake is repeated in the case of the other typical specimen of 25 inches, of which the tail is $5\frac{1}{4}$ inches ; it has 167 ventrals (including three situated below the head which Blyth had

* I never met a specimen with only 12 teeth, but Günther records that number.

evidently not counted), and 74 pairs of sub-caudals. The third more uniformly coloured specimen has 170 ventrals, and 75 pairs of sub-caudals. All specimens have traces of dark spots on the ventrals.

Thus the identity of *macrops* and *macrophthalmus*, both of which came from the vicinity of Darjiling, cannot be questioned. But I very much doubt that even *T. Sikkimensis*, lately described by Dr. Anderson from the same locality, is anything but a rather uniformly coloured variety of *macrops*. General form, dilatable neck, large eye, structure of shields on the head and scales on the body are to all appearance perfectly identical. The only difference I can trace between *macrops* and the few specimens referable to *T. Sikkimensis* is, that in the latter the vertical is a little longer, but this is not the case to any such extent as would not be found repeated in other varieties of one and the same species.

In the two specimens, described by Anderson as *T. Sikkimensis*, the scales are somewhat feebly keeled, but this is most likely a sexual difference. I have obtained a male specimen from the Rangnu valley below Darjiling, and in this the scales are very distinctly keeled, (precisely as in *macrops*). It has, like the type, 19 rows of scales, posterior to the middle 17, and towards the anus only 15 (like *macrops*). The anterior frontals are slightly less than, or equal to, one half of the posterior frontals, which is also the case in the two types of *Sikkimensis*. Vertical 5-sided, the lateral sides about equal to, or shorter than, the front margin, but not longer; the posterior sides are shortest and form a right angle. The supraciliaries are slightly longer than the vertical; the occipitals are obliquely truncate behind, meeting at the suture with an inwardly bent angle. Temporals 2 + 3. Anterior chin-shields in contact with 4 or 5 lower labials. All these variations of structure are perfectly the same, as may be seen in specimens of *macrops*.

As regards general coloration, my specimen agrees with *macrops* (typical) in being brown above, while both those* described by Dr. Anderson are pale olive; front neck tinged with green, but without a distinct collar; body reticulated with black and yellow, the black having an inclination to form laterally irregular blotches.

* But fresher specimens which he subsequently received are also distinctly brownish.

Below, anterior half bright yellow, gradually passing into dull greenish white on the posterior half; most of the ventrals with two large quadrangular, sometimes confluent, blackish spots, these spots become less distinct on the posterior belly, and disappear on the tail. The bent up portion of all the ventrals is dusky brown; tail below most minutely freckled with dark.

I have compared several specimens of typical *macrops* with four specimens referable to *Sikkimensis*, but I confess I cannot persuade myself to believe that they belong to two distinct species. It is true, none of the four specimens of the latter have a dorsal series of distinct pale spots and a very distinct collar, while seven specimens of typical *macrops*, which I examined, have the dorsal series of pale yellowish spots distinct, but Günther says of his *macrophthalmus* "uniform or with a dorsal series of reddish brown spots." This statement almost removes the last doubt one could have about the identity of the two forms. Both have 20-25 closely set maxillary teeth, the two last stronger but scarcely separated by an interspace from the others.

I also received through Mr. Kurz a specimen of *macrops* from the Pegu hills between Prome and Tonghoo.

TROPIDONOTUS PLUMBICOLOR, (I. R., p. 272).

This species extends from Ceylon all through South India, Central India, Qualior and northwards towards Amballa. Dr. Waagen lately obtained through a collector a specimen from as far east as Sahibgunj, on the west side of the Ganges, and this locality may be regarded as the present known eastern limit of the distributional province of the species: it lies almost on the boundary between the Indian and the Malayan fauna.

The collar is in young specimens bright yellow or orange, changing to white in spirits. It disappears in some specimens sooner than in others, occasionally long before they are full grown.

Fam. PSAMMOPHIDÆ.

PSAMMOPHIS CONDANURUS, (I. R., p. 291).

A specimen collected by Dr. Day at Hurdwâr agrees in coloration with those* described from Simla, in J. A. S. B., vol. xxxix,

* Dr. Anderson has been so kind as to re-describe these specimens in Proc. Zool. Soc., for 1871, p. 182.

p. 96, but the head is uniform greenish brown. The two light dorsal bands, noted in the Simla specimens, become, however, apparent on the neck, uniting again on the posterior $\frac{1}{4}$ of the body into a single broad, pale yellowish brown band, which disappears at the root of the tail, the latter being uniform olive brown above.

Dr. Günther has described from Sind *Ps. Leithii*, a very closely allied species having the median light dorsal band single along the whole body. I do not think it improbable that this form may be shewn to be only a variety of *Ps. condanurus*, (comp. Proc. Zool. Soc., London, for 1869, p. 505), for the few differences in the structure of the head shields and scales appear to be such as are often liable to variation.

Fam. DIPSADIDÆ.

DIPSAS FORSTENI, (I. R., p. 309).

This South Indian form has also been found in the Bundelcund, and I have received it from Bír bhúm, and from the base of the Sikkim hills at Pankabaree. A specimen from the latter locality measures 58 inches; it has 25 scales on neck and 23 round the middle of the body; temporals 2 + 3, two only being in contact with the post-oculars, ventrals 268, sub-caudals 130. General colour above brownish olive, two blackish ovate spots on neck behind the occiput, followed by somewhat irregular transverse black bands with their angles directed forwards, becoming less distinct after the first third of the length of the body, and at the side replaced by dark reticulations; a blackish streak from each eye to the angle of the mouth, but no streak along the occiput, as usually present in South Indian specimens; below olive grey, lighter on the chin, and further on with a row of white spots on each side, 3 or 4 ventral shields distant.

The specimen had been killed near a house after having a short time previously feasted upon a young chicken.

DIPSAS HEXAGONOTUS, Blyth.

Dr. Anderson has traced the adult of this species, the young of which I described and figured in J. A. S. B., vol. xxxix, p. 198, pl. xi, fig. 4, (Comp. Proc. Zool. S., Lond., for 1871, p. 185).

I have received numerous adult specimens from the Rangnu and Tista valleys in Sikkim and from near Pankabaree. They are all uniform reddish brown above, with the skin between the scales more or less blackish ; yellowish, or partially pinkish, white below. The young snake is marked with numerous narrow transverse dark bands, which disappear with age.

In structure the adult snake does not differ essentially from the young, except that the snout sometimes becomes a little produced, and the size of the anterior frontals is fully, or somewhat more than, one half of the posterior, the vertical is somewhat broader anteriorly than posteriorly. The temporals vary much in size and number, some specimens having only one short temporal in contact with the post-oculars, followed by two longer ones ; but generally there are $2+2+3$ or $2+3+3$ temporals. The large size of the eye and the low labials below the eye are, besides the coloration, among the most prominent characters of this species. The præ-anal shield is occasionally bifid in young, but in adults appears to be always entire.

There are only 6 or 7 maxillary teeth, the posterior the largest, but there are besides generally 5 or 6 intermediate teeth present which are not permanently fixed to the jaw, being apparently kept ready to fill up vacancies, if any of the other teeth be broken off. Palatine teeth are 10-12, the 1st to 3rd or 4th gradually increase in size, the 3rd or 4th being the largest, the following 6—8 teeth are small and separated from the third by a more or less wide interspace. In the mandible there are 12 to 14 teeth, the anterior somewhat larger than the posterior.

I cannot agree with Dr. Anderson's suggestion (loc. cit., p. 186) that Blyth's *D. multifasciata* is identical with the present species, the former having been re-described and figured by me in Jour. Asiat. Soc., Beng., vol. xxxix, p. 199, pl. xi, fig. 6. I have again examined Blyth's typical specimen of *multifasciata*, and find it to agree perfectly with my former account. A cursory inspection of my figure will shew, that the eye of *multifasciata* is very much smaller, that consequently the upper labials are more developed, the præ-ocular is also much smaller and narrower, the snout slightly less abruptly contracted, the vertebral series of scales

less enlarged and more elongated. The transverse dark bands in the young are narrow, but distinct and directed forwards on the back; in the adult the bands are dissolved into spots, more or less distinctly arranged quincuncially; there is always a dark band present from the eye to the angle of the mouth; the lower side is checkered and more or less spotted with brown.

D. hexagonotus, as compared with the above, has the eye much larger, the præ-ocular well developed, the whole head is comparatively stouter and more bulging, the vertebral series of scales larger and more distinctly hexagonal. The general colour of the body is ferruginous brown, instead of fulvous brown, the dark bands in the young are moderately broad, and cross the back in an almost straight course, and the belly has only occasionally slight traces of darkish spots; but all the spots and bands above and below disappear with age.

I do not think that the specific distinction of these two forms can be questioned. The former resembles in coloration *D. Forsteni*, and belongs to the fauna of India proper, the latter belongs to the type of *D. bubalina*, or *boops*, and characterises the Malay fauna.

DIPSAS BUBALINA (I. R., p. 311).

A specimen measuring 42 inches, obtained in the Rangnu valley below Darjiling, agrees in all essential characters with Günther's description of the above species; it has 250 vent., and 124 sub-caudals. The head is not so stout, and the neck decidedly more slender than indicated in Günther's figure, but this could not be regarded as a specific distinction; there are $3 + 3 + pl.$ temporals on both sides of the head, all three anterior ones being in contact with the two post-oculars. Colour above bluish green, below yellowish white, gradually assuming a greenish tinge posteriorly; the lower light colour is separated from the upper by a faint whitish line, which runs on each side along the ventral shields, some distance from their terminations; on the tail the pale line becomes obsolete. Inside mouth, the interstitial skin on the head and neck is black, but very faintly so on the rest of the body.

Blyth's *D. nigromarginata* from Assam is clearly identical with *bubalina*, the apical grooves are so faint, as to be hardly traceable,

but they are present* in the type specimen. The interstitial skin is distinctly black on the head and neck, but less so on the rest of the body, the neck is slender, as in the Sikkim specimen previously noticed.

The latter has only eight permanently fixed teeth in each maxillary, there are, however, seven others interposed between them, hardly differing in size, but not fixed to the jaw; 14 palatine and about an equal number of mandibular teeth, the anterior 3 or 4 of these are considerably larger than the rest.

Adult specimens of *hexagonotus* chiefly differ from the present species by their shorter head, generally somewhat longer occipitals, less high upper labials, and by their ferruginous coloration.

DIPSAS TRIGONATA, (I. R., p. 312).

I have examined some specimens of this common species from South and East of Agra, and they had the white, dark edged, bands quite isolated from each other in crossing the back, and not connected by a zigzag line along the median line as is more usually the case.

Fam. LYCODONTIDÆ.

LYCODON JARA.

Leptorhytaon jara, I. R., p. 321.

Dr. Günther made this species the type of his new genus *Leptorhytaon*. The principal differences given between the characteristics of *Lycodon* and *Leptorhytaon* are, that in the former the body is "slightly compressed," and the "nostrils between two shields," while in the latter the body is said to be "not compressed," and the nostril in "one nasal shield."

I have examined several specimens of the present species; some taken alive near Calcutta, others from the base of the Sikkim Himalayas and from Pegu, and I find that in *L. jara*, the body is quite as much, or rather quite as little compressed, as, for instance, in *Lycodon aulicus*. One specimen has a distinct suture above the nostril, dividing the shield into two parts, and below the nostril there is a groove indicating a suture. Two other specimens have clearly two nasal shields, as perfectly distinguishable as they are also in *L. aulicus*.

* Not absent, as I stated in J. A. S. B., vol. xxxix, p. 199.

The scales are in both the species referred to apparently smooth, but under the lens a very fine striation, or rather sulcation, is perceptible in both. The habits and general characters of both are also exactly the same.

I do not consider it, under these circumstances, necessary to separate the present species *generically* from *Lycodon*.

To the description of the species I may add, that each scale has a very minute sub-apical impressed dot.* The occipitals are as a rule obtusely angular posteriorly. The præ-ocular is sometimes very small, or it reaches the top of head, and is in contact with the anterior frontals. The 9th upper labial is longer than high. One or two temporals are in contact with the post-oculars.

Fam. HOMALOPSIDÆ.

HYPSIRHINA ENHYDRIS (I. R., p. 281).

Specimens, identical in coloration with those noted by Theobald from Pegu (Linn. Soc. Zool., vol. x), also occur in Lower Bengal. Günther says: scales "constantly in 21 series." I have obtained from the Sundarbunds, below Port Canning, one specimen, which has 23 rows of scales; but it does not differ in any other point of structure or coloration from other typical specimens. The lateral pale bands are generally in Bengal specimens distinct, but the brown bands along the back are less so; the central dark line along the belly is often nearly continuous, except on the throat where it is dissolved into spots.

Fam. CROTALIDÆ.

TRIMERESURUS ANDERSONI, Theob.

Trim. Andersoni and *obscurus*, Theobald, Cat. Rept. Asiat. Soc. Museum, 1868, pp. 75 and 76.

In my paper on Malayan Reptiles, &c. (Journ. Asiat. S. B., vol. xxxix, p. 216), I stated that the two specimens described by Theobald under different names belong to one species only. The locality of those two specimens was unknown, though there could have been little doubt, but that the snakes were Indian. I have

* I have not observed an 'apical groove.'